

Applicant : Ronald P. Knockeart et al.
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The claims have not been amended. The following listing of claims is provided for the convenience of the examiner.

1-21. (Cancelled)

22. (Previously presented) A method for detecting when a vehicle deviates from a planned route comprising:

- tracking a first estimated position of the vehicle using signals from a positioning system that are received at the vehicle;
- tracking a second estimated position of the vehicle using an estimate of a distance traveled and the planned route, wherein the planned route includes a first point along the route and a path along the route following the first point, and wherein tracking the second estimated position includes detecting when the vehicle is at the first point on the planned route, estimating a distance traveled after detecting the vehicle is at the first point, and determining the second estimated position according to a position along the planned route at the estimated distance on the path following the first point; and
- detecting that the vehicle has deviated from the planned route when the first estimated position and the second estimated position differ by at least a tolerance distance.

23. (Cancelled).

24. (Previously presented) The method of claim 22 further comprising adjusting the tolerance distance, including reducing the tolerance distance when the vehicle is detected to be at the first point on the planned route, and increasing the tolerance distance as the vehicle travels following the first point.

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25. (Previously presented) Software recorded on a computer readable medium for causing an in-vehicle computer to perform the functions of:

tracking a first estimated position of a vehicle using signals from a positioning system that are received at the vehicle;

tracking a second estimated position of the vehicle using an estimate of a distance traveled and the planned route, wherein the planned route includes a first point along the route and a path along the route following the first point, and wherein tracking the second estimated position includes detecting when the vehicle is at the first point on the planned route, estimating a distance traveled after detecting the vehicle is at the first point, and determining the second estimated position according to a position along the planned route at the estimated distance on the path following the first point; and

detecting that the vehicle has deviated from the planned route when the first estimated position and the second estimated position differ by at least a tolerance distance.

26. (Previously presented) A vehicle tracking system comprising:

a first position estimator including a positioning system receiver, for determining a first estimate of the vehicle's location determined using information received from the positioning system receiver;

storage for a planned route;

a second position estimator coupled to a vehicle motion sensor and to the storage for the planned route, for determining a second estimate of the vehicle's location using information received from the vehicle motion sensor and the planned route, wherein the planned route includes a first point along the route and a path along the route following the first point, and wherein tracking the second estimated position includes detecting when the vehicle is at the first point on the planned route, estimating the distance traveled after detecting the vehicle is at the first point, and determining the second estimated position according to a position along the planned route at the estimated distance on the path following the first point; and

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an off-route detector coupled to the first position estimator and to the second position estimator, for comparing the first estimate of the vehicle's position and the second estimate of the vehicle's position.

27. (Previously presented) The software of claim 25, further causing an in-vehicle computer to perform the functions of adjusting the tolerance distance, including reducing the tolerance distance when the vehicle is detected to be at the first point on the planned route, and increasing the tolerance distance as the vehicle travels following the first point.

28. (Previously presented) The vehicle tracking system of claim 26 in which the off-route detector indicates that the vehicle has deviated from the planned route when the first estimate and the second estimate differ by at least a tolerance distance.

29. (Previously presented) The vehicle tracking system of claim 28 in which the off-route detector reduces the tolerance distance when the vehicle is detected to be at the first point on the planned route, and increases the tolerance distance as the vehicle travels following the first point.